

REPORT OF POLLEN MORPHOLOGY OF ARACEAE

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Abstract The diversity of Araceae is shown markedly in its habit, external morphology and phytogeography, as well as in its pollen morphology. The pollen of Araceae is still little known. A comparative small number of species have so far been investigated. The present paper deals with the pollen morphology of seven genera and 18 species. The pollen grains were all examined under LM and SEM. Among these, four genera (*Zantedeschia*, *Amorphophallus*, *Typhonium* and *Pinellia*) and 17 species are palynologically reported here for the first time. The research results have shown that there are intergeneric and even interspecific differences in pollen shape, size, type of aperture, ornamentation and exine structure.

Key words Diversity, pollen morphology, Araceae.

The pollen grains of Araceae are subspheroidal or anomoshae, elliptical, 10 elongate elliptical, or subcircular in polar view, $16.2 - 58.9 \times 13.1 - 44.2 \mu\text{m}$, anacolpate tenuate and nonaperturate. The exine is 2-layered and $2.1 - 4.2 \mu\text{m}$ thick, the sexine is slightly thicker than or equal to the nexine, but sometimes the stratification is obscure. The surface is subpsilate, slightly granular (scabrous) spinate, cerebelloid or costate-striate under LM, and scabrous scaleformed cerebelloid spinate coarsely or finely spinate, costate-striate, granulum-spinate and granulum-striate on the surface under SEM.

The pollen grains of Araceae may be divided clearly into two types: anacolpate type and nonaperturate type. The voucher herbarium of our experimental materials are listed in Table 1.

1. Anacolpate Type

The pollens of *Zantedeschia*, *Typhonium*, *Amorphophallus*, and *Pinellia* belong to the anacolpate type. Based on the differences in surface ornamentation, they may be divided into six sub-types.

(1) Granulate or Obscurely Granulum

Z. aethiopica (L.) Spreng. (See plate 1:1 - 6)

T. kunmingense. (See plate 1:7 - 16)

(2) Scaleformed or Cerebelloid

A. konjac. (See plate 1:17 - 22)

(3) Scaleformed or Striate

A. bannaensis. (See plate 2:7 - 9)

A. pingbianensis. (See plate 2:10 - 12)

(4) Subpsilate or Striate

A. albus. (See plate 2:13 - 15)

(5) Granulate and Castate-striate

A. krausei. (See plate 3:1 - 3)

A. dunnii. (See plate 3:4 - 6)

A. yunnanensis. (See plate 3:7 - 9)

(6) Castate-striate

P. peditisecta. (See plate 3:10 - 18)

Table 1. Vouchers for Pollen Morphological Experiments

Coding Number	Scientific Name	Herbarium and Specimen Number, or Date Collected
051	<i>Amorphophallus albus</i>	KUN 92019
052	<i>Amorphophallus kachinensis</i>	KUN 9201
053	<i>Amorphophallus dunnii</i>	KUN 92001
054	<i>Amorphophallus konjac</i>	KUN 92002
055	<i>Amorphophallus nanus</i>	KUN 88001
056	<i>Amorphophallus pingbianensis</i>	KUN 87081
057	<i>Amorphophallus yunnanensis</i>	KUN 87114, 8802
058	<i>Amorphophallus krausei</i>	KUN
059	<i>Arisaema decipiens</i>	KUN
060	<i>Arisaema erubescens</i>	KUN
061	<i>Arisaema flavum</i>	KUN 93024
062	<i>Alocasia odora</i>	KUN
063	<i>Remusatia pumila</i>	KUN
064	<i>Remusatia yunnanensis</i>	KUN
065	<i>Pinellia pedatisecta</i>	May 23, 1992
066	<i>Typhonium kunmingense</i>	May 23, 1992
067	<i>Zantedeschia aethiopica</i>	CDBI

2. Nonaperturate Type

The pollens of *Alocasia* (Schott) G. Don, *Remusatia* Klotzsch and *Arisaema* Mart. belong to the non-aperturate type. It can be divided into 4 sub-types.

(1) Subpsilate or Finely Granulate

A. macrorrhiza. (See plate 4:1-5)

(2) Granulate and Striate

R. pumila. (See plate 5:18-20)

(3) Nano-pinate

A. decipiens. (See plate 4:6-10)

A. flavum. (See plate 4:16-20)

(4) Long-spinate

A. erubescens. (See plate 4:11-15)

A. sinii. (See plate 5:1-8)

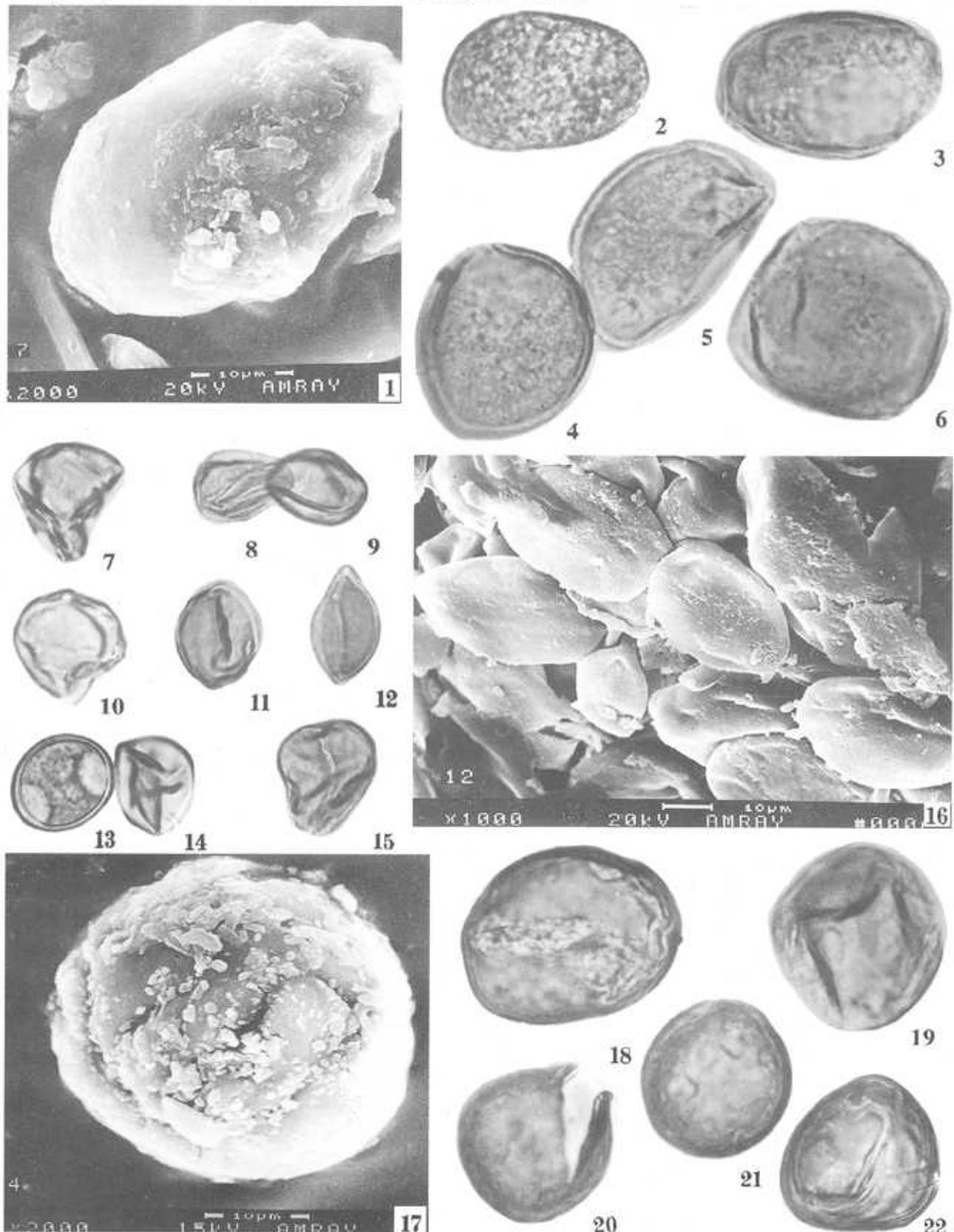
R. yunnanensis. (See plate 5:9-17)

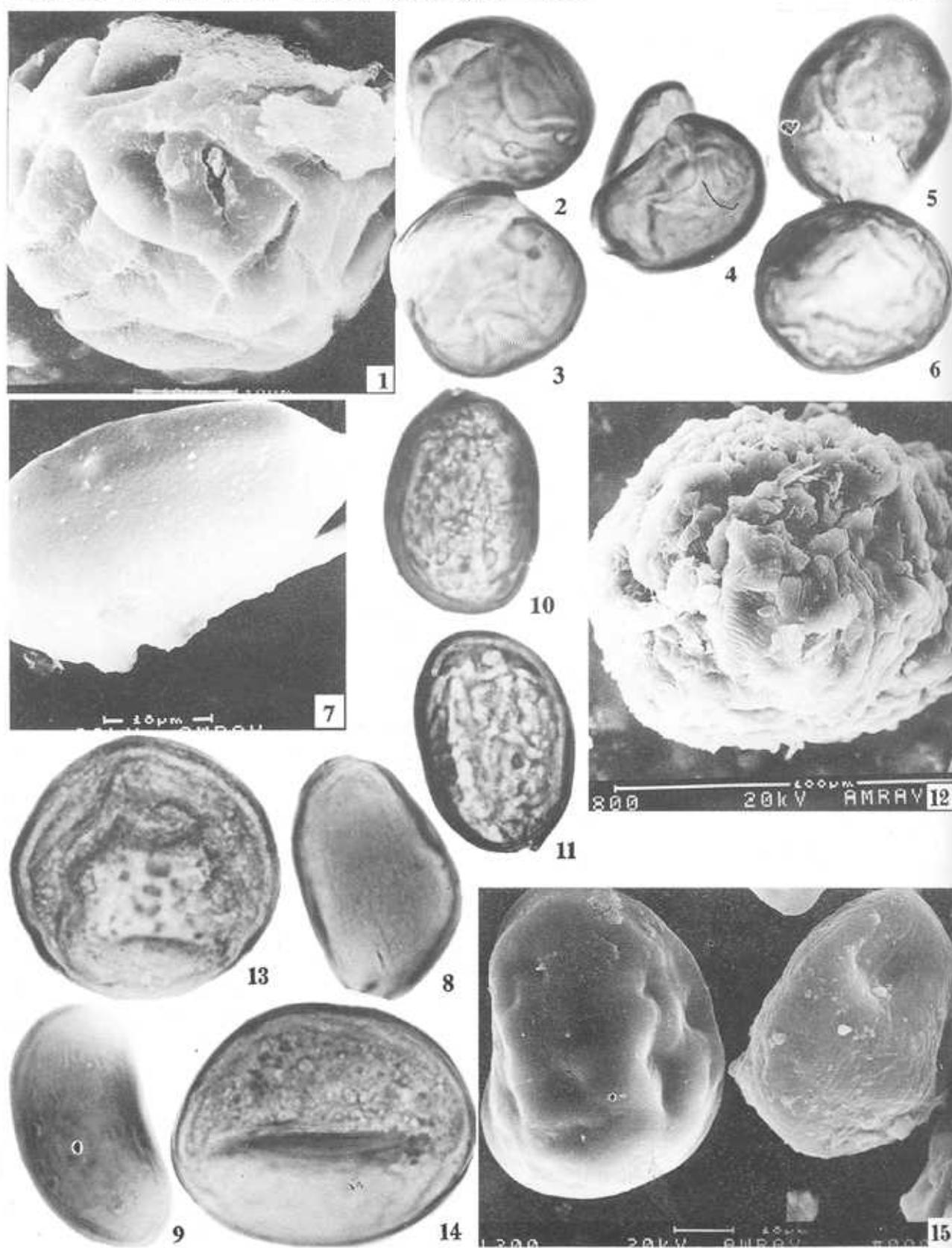
The pollen grains of these 18 species in 10 sub-types illustrates the diversity of pollen morphology of Araceae.

REFERENCES

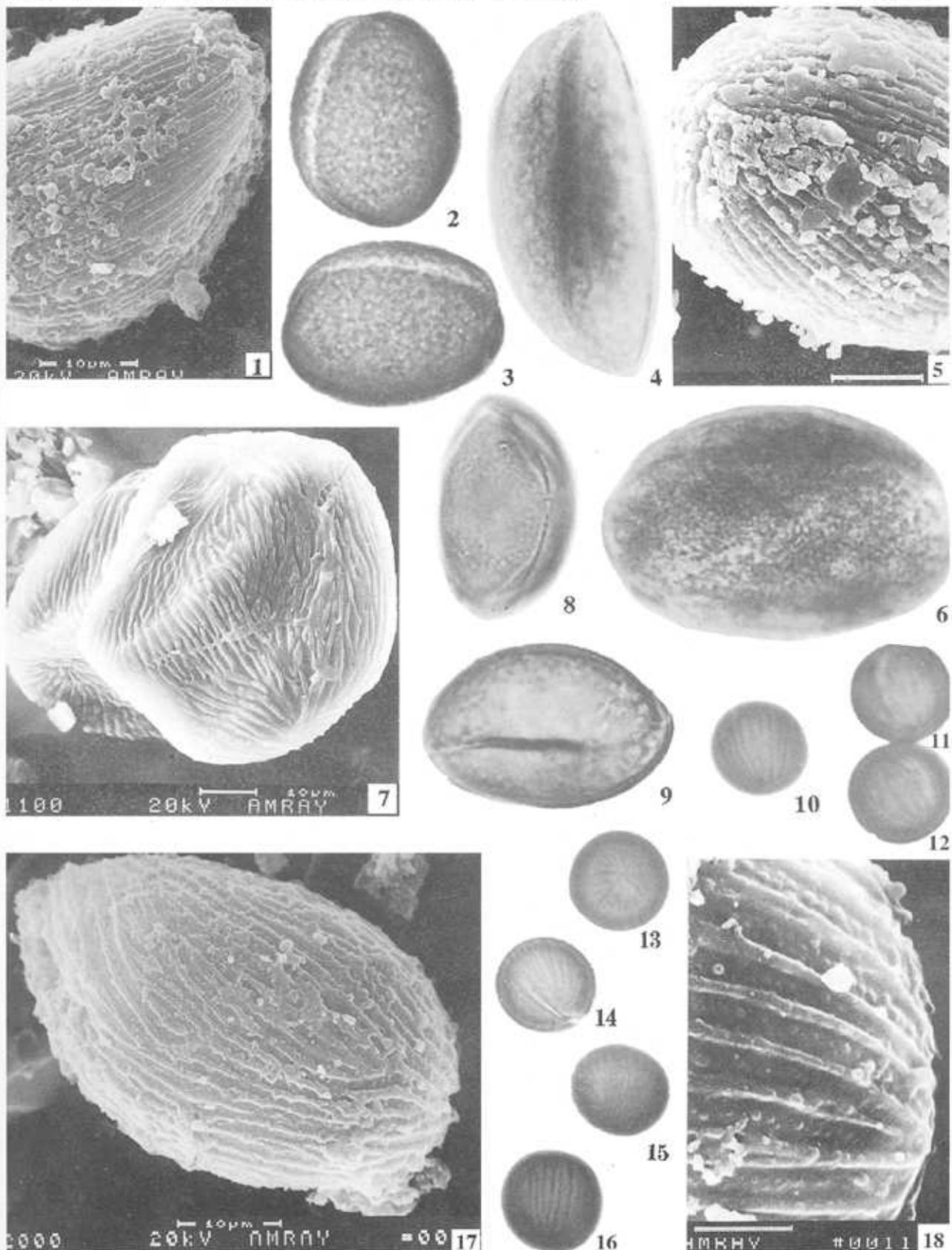
Li Heng, 1979. Araceae. In: Flora Reipublicae Popularis Sinicae 13(2):84-100. Beijing: Science Press.

Walker J W, 1975. Comparative pollen morphology and phylogeny of the ranalean complex. In: C B Beck (ed.) Origin and Early Evolution of Angiosperms: 241-278. New York: Columbia University Press.

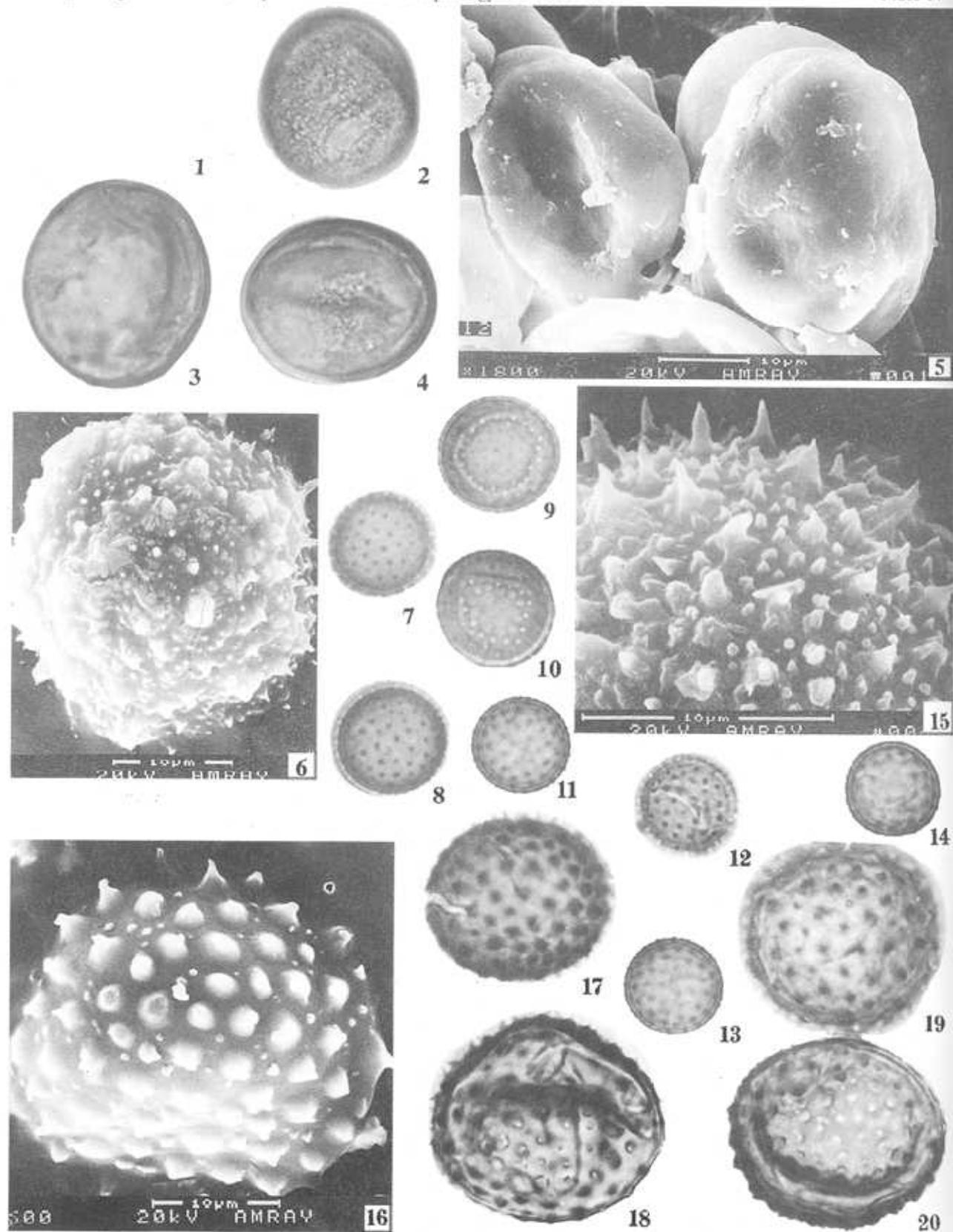
1 - 6. *Zantedeschia aethiopica*; 7 - 16 . *Typhonium kungmingense*; 17 - 22. *Amorphophallus konjac*.



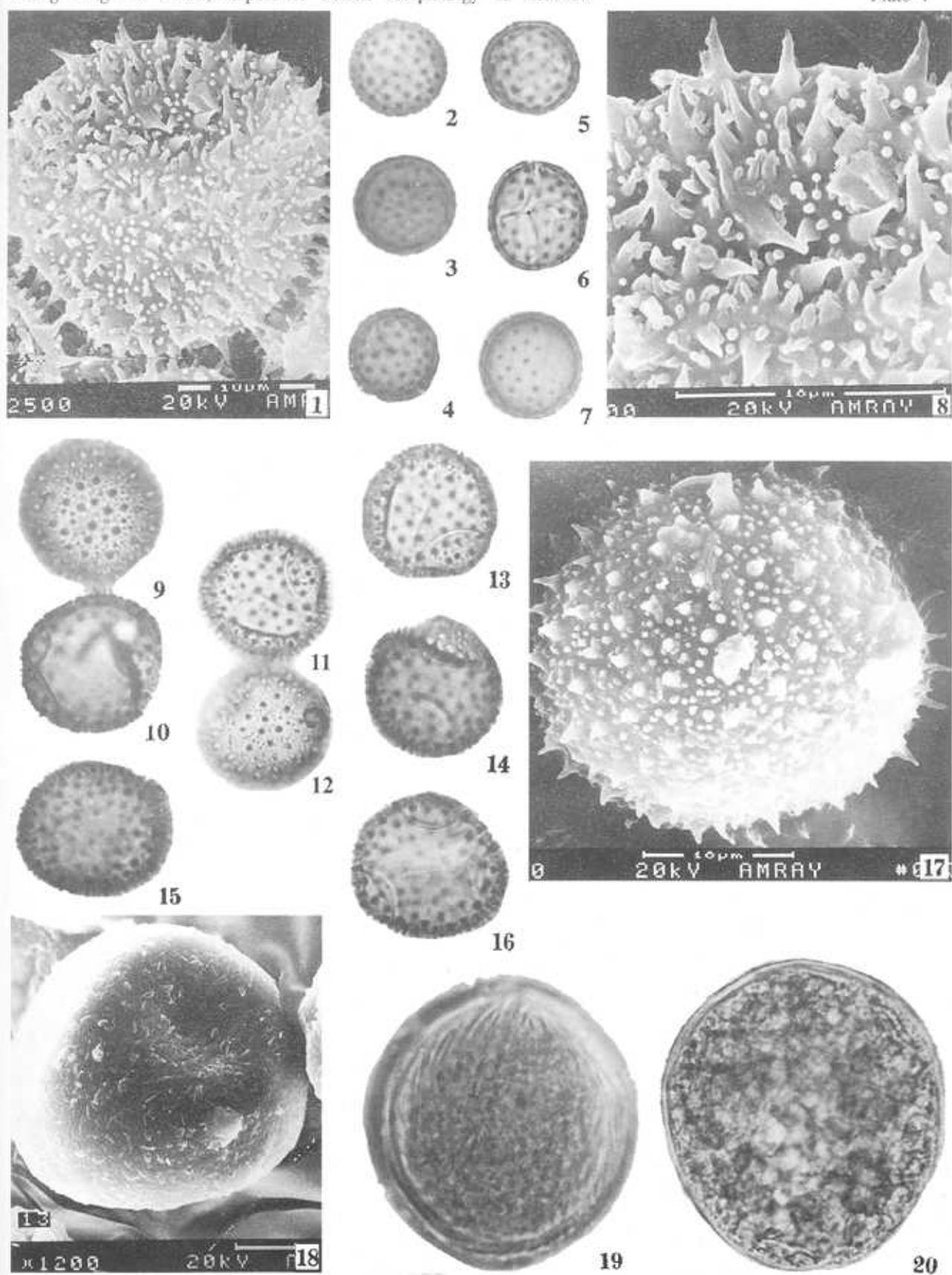
1 - 6. *Amorphophallus nanus*; 7 - 9. *Amorphophallus kachinensis*; 10 - 12. *Amorphophallus pingbianensis*; 13 - 15. *Amorphophallus albus*.



1 - 3. *Amorphophallus krausei*; 4 - 6. *Amorphophallus dunnii*; 7 - 9. *Amorphophallus yunnanensis*; 10 - 18. *Pinellia pedatisecta*.



1 - 5. *Alocasia odora*; 6 - 10. *Arisaema decipiens*; 11 - 15. *Arisaema erubescens*; 16 - 20. *Arisaema flavum*.

1 - 8. *Arisaema sinii*; 9 - 17. *Gonatanthus yunnanensis*; 18 - 20. *Gonatanthus pumilus*.